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ABSTRACT OF THE DISCLOSURE:-

A cushion cover is placed in a mould and a bag of controlled wet strength material is inserted in the cover. Flexible plastic foaming liquid is pumped into the bag which retains the liquid until it begins to expand. When it fills the bag, the bag disintegrates and the foaming continues until the cushion is filled.

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This invention relates to new and useful improvements in forming plastic or foam cushions within a fabric cushion cover or the like.

Conventionally, a block of foam is covered with a cushion cover and zipped or stitched in place. Disadvantages of this method includes the fact that strain is concentrated at the seams or welts of the cover and that it is difficult to form the foam block with the exact configuration of the cover so that quilting, buttoning or the like is difficult to accomplish, yet maintain a smooth appearance to the cover.

Attempts have been made to inject foaming liquid into the cover, but the principal disadvantage here is due to the fact that such liquid remains in the liquid phase for several seconds before foaming commences. While in the liquid phase, it soaks into the cover material and the amount that soaks in, cannot foam so that it merely hardens thus forming a stiffened area of the cover which is not only undesirable, but makes it difficult to inject the exact amount of liquid required to fill the cushion with foam.

The obvious solution is to coat the inside of the cover with a liquid proof material such as a rubber film. However, under these circumstances, of course, the cushion



cannot breathe when in use so that it becomes very stiff and inflexible and is not at all comfortable.

A I overcome all of these disadvantages by providing a paper bag or a bag of similar ^{flexible frangible} material having wet strength which is placed within the cover. The foaming liquid is injected into the bag which retains the liquid until foaming commences at which time the expansion of the foam bursts the bag so that the foaming can continue. At this time, of course, the liquid phase has passed so that no soaking into the fabric can occur.

The bag disintegrating during the expansion, becomes incorporated with the foam and does not interfere with the final product.

One of the principal advantages from the use of this invention is the fact that the cushion cover can be made of any configuration and with any exterior patterning desired, a mould within which the cover is inserted, ensuring that the foam fills the cover and follows the contour or shape thereof. Inasmuch as the foam adheres to the interior surface of the cover, this shape such as quilting or the like, is maintained during use.

Another advantage of the invention is the fact that due to the adherence of the cover to the foam, strain is equally distributed and is not concentrated upon the seams and/or the welts.

A yet further object of the invention is to provide a device of the character herewithin described in which a

complete cover can be used, or alternatively, an open based cover with a panel of fabric closing off the open base and being adhered to the foam.

5 A yet further object of the invention is to provide a device of the character herewithin described which is simple in construction, economical in manufacture and otherwise well suited to the purpose for which it is designed.

10 With the foregoing in view, and such other or further purposes, advantages or novel features as may become apparent from consideration of this disclosure and specification, the present invention consists of, and is hereby claimed to reside in, the inventive concept which is comprised, embodied, embraced or included in the method, process, construction, composition, arrangement or in combination of parts, or new use
15 of any of the foregoing, of which concept, one or more specific embodiments of same are herein exemplified as illustrative only of such concept, reference being had to the accompanying Figures in which:-

20 Figure 1 is a cross sectional view of a mould with the liquid just injected into the bag.

Figure 2 is a view similar to Figure 1, but showing the liquid expanded and foaming to fill the bag.

Figure 3 is a view similar to Figure 1 and showing the bag having been burst by the expanding foam.

25 Figure 4 is a view similar to Figure 1, but showing the foam fully expanded and filling the cover within the mould.

Figure 5 is a cross sectional view showing an al-

ternative mould configuration.

Figure 6 is a cross sectional view showing an alternative mould configuration.

Figure 7 is a cross sectional view showing an alternative mould configuration.

Figure 8 is a fragmentary cross sectional view showing a mould with a different method of closing one side of the cushion.

Figure 9 is an expanded fragmentary cross sectional view showing the welt retaining means used.

In the drawings like characters of reference indicate corresponding parts in the different figures.

Proceeding first to describe the invention as shown in Figures 1 to 4 inclusive, reference character 10 illustrates generally a mould, the interior of which is provided with a configuration similar to that of the finished cushion. In other words, this mould may be rectangular when viewed in cross section or wedge-shaped and the length [not illustrated] may be any convenient length to suit the size of the cushion being formed.

The mould consists of a base 11, side members 12 and a top plate 13.

All of these members are provided with flanges 14 at the mating edges thereof, said flanges being in interfacial relationship when the mould is assembled and being held together by means of bolt and nut assemblies 15.

Welt or bead receiving grooves 16 are formed within the mould adjacent the corners thereof as clearly illustrated.

ted.

A fabric cushion cover 17 is sewn in the usual manner and has a size that will fit within the mould when filled with plastic foam.

- 5 A small slit or aperture 18 is formed in one wall of the cover and this registers with an aperture 19 within one wall 12 of the mould.

- Means are provided to anchor the cover in position and one embodiment of this means is shown in Figure 9. A plurality of pins 20 extend upwardly from one of the mould sides adjacent the welt groove 16 and the welt 21 of the cover 17 is hooked over these pins as clearly shown thus holding the bag against the sides of the mould prior to foaming taking place.
- 10

- Means are provided to receive the foaming liquid and to maintain it out of contact with the fabric of the cover 17 until the liquid phase has passed and foaming has commenced. This is in order to prevent the liquid form from soaking into the fabric and causing hard or stiffened areas.
- 15

- The means shown includes a bag or container collectively designated 22. This bag is preferably made of wet strength paper, but of course, can be made of any suitable material. The bag is, of course, much smaller in volume than the interior of the mould and the open end 23 of the bag is extended through the slit 18 in the cover and through the opening 19 in the side of the mould so that a plastic foam injection nozzle 24 can be inserted through the bag opening, through the opening 19 and thence into the interior 25 of the bag within the mould.
- 20
- 25

A predetermined amount of foaming liquid 25' is injected or pumped into the bag whereupon the nozzle is removed and the open end 23 is closed off. Reference character 26 shows schematically any form of clamping means to accomplish this while the foaming action takes place.

The liquid passes from the liquid phase to the cream phase at the beginning of the foaming action at which time the liquid has expanded to fill the bag 22 as shown in Figure 2.

Further expansion of the foam bursts the bag as shown in Figure 3 with the bag fragments 22' being dispersed within the foaming mass as it expands.

Figure 4 shows the final fully expanded foam mass 25" with the bag fragments 22' dispersed therethrough. The foam, which is preferably a high density flexible foam such as polyurathane, has the quality of adhering to the inner surface 27 of the cushion cover 17 and sufficient liquid is placed therein so as to ensure that the cover 17 is placed under slight tension and forced outwardly against all of the sides of the mould thus providing a filled cushion when the foaming action is completed. The cover 13 is removed and the cushion may then be removed from the mould. At this point, the slit 18 may be sewn together or stapled as desired.

The foam cushion is then preferably passed through crushing rollers [not illustrated] in order to break down the closed cellular structure of the foam and allow same to breathe during use.

Figures 5 and 6 show an alternative construction

of the mould in which conical projections 28 extend upwardly from the one side thereof thus forming conical open recesses within the foam. This is used, of course, where the finished cushion is open-based and is merely closed off with a fabric panel 29 as shown in Figure 8. This fabric panel, of course, adheres to the foam and may be made of lining material in contrast to upholstery material which is considerably more expensive.

In Figure 6, the welt line 30 is situated intermediate the top and bottom sides of the mould. Here again [not illustrated] pins as illustrated in Figure 9 may be used to hold the welt of the cover into the welt grooves during the foaming action. The base 11 of the mould in Figures 6 and 7 which is of course, the upper surface of the finished cushion, may be provided with contouring 31 to correspond with similar contouring formed in the cushion cover as by quilting, buttoning or the like, and the contouring of the cushion cover of course, fits exactly into the contouring 31 so that the pressure of the expanded foam presses the cover into position and fills the cover around these contours thus giving this contour to the finished cushion.

As hereinbefore mentioned, the moulds can be wedge-shaped, square or rectangular in plan as desired depending upon the finished cushion shape required and it should be stressed that the flexibility of the cushion can be controlled, within limits, by the quantity of foam liquid injected initially.

Various modifications can be made within the scope

of the inventive concept which is herein disclosed and/or claimed. Accordingly, it is intended that what is set forth should be regarded as illustrative of such concept and not for the purpose of limiting protection to any particular embodiment

5 thereof, and that only such limitations should be placed upon the scope of protection to which the inventor hereof is entitled as justice dictates.

WHAT I CLAIM AS MY PRESENT INVENTION IS:-

(1) A method of forming foam cushions comprising the steps of placing a cushion cover in a mould, placing a bag of flexible frangible material in the cover and then pumping in a predetermined amount of plastic foaming liquid, the bag retaining the liquid until said liquid has started to foam whereupon the bag is fractured by the expanding foam.

(2) A method of forming a foam cushion which comprises the steps of placing a cushion cover in a mould, inserting a bag of flexible frangible material within the cover, and then pumping in a predetermined amount of flexible plastic foaming liquid into said bag, retaining said liquid in said bag until foaming commences, and then bursting said bag by the expansion of said foam thereby filling the cover with the expanded foam.

(3) The method according to Claim 2 which includes means to detachably secure said cover within said mould.

(4) The method according to Claim 1 which includes the further step of passing said cushion through ^{a set of} ~~said~~ crushing rollers to break down the closed cellular structure of said foam.

(5) The method according to Claim 2 which includes the further step of passing said cushion through a set of crushing rollers to break down the closed cellular structure of said foam.

(6) The method according to Claim 3 which includes the further step of passing said cushion through a set of crushing rollers to break down the closed cellular structure of said foam.

(7) In a method of forming a plastic foam cushion with a flexible cover thereon, the steps of; placing a flexible fabric cover in a mould so that the cover conforms to and lies against the interior surfaces of the mould and an empty space is thus defined inside the cover; placing an empty bag of frangible material inside the cover with the mouth portion of the bag projecting outwardly from the cover and mould, the bag having a capacity considerably smaller than the volume of the empty space inside the cover; introducing into the bag a predetermined amount of liquid which is capable of foaming into a flexible resilient cellular mass; closing off the bag mouth and retaining the liquid in the bag until foaming commences; permitting the frangible bag to burst into pieces by expansion of the foaming liquid into a cellular mass which completely fills the space inside the cover, with pieces of the burst bag being dispersed in the cellular mass; removing the formed cushion with the cover from the mould; and passing the cushion with the cover through crushing rollers to break down the closed cellular structure of the mass.

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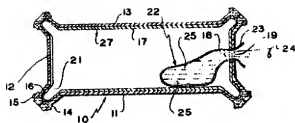


FIG. 1

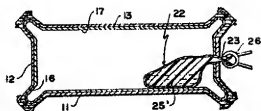


FIG. 2

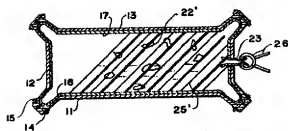


FIG. 3

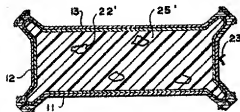


FIG. 4

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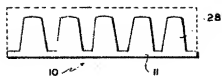


FIG. 5

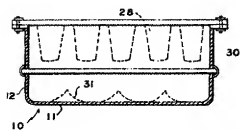


FIG. 6

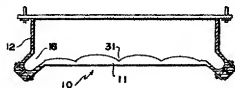


FIG. 7

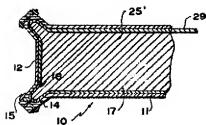


FIG. 8

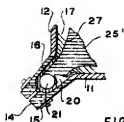


FIG. 9

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